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Ethnobotanical investigation of plants used in the treatment of Prostatitis in the prefecture of Boke

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ABSTRACT

Within the framework of the valorization of medicinal plants traditionally used in the treatment of prostatitis in the prefecture of Boké, we carried out an ethnobotanical survey from April 06 to July 02, 2018. During this survey, we met 35 healers, mostly herbalists and marabouts, including 23 men and 12 women. These tradi therapeutes practiced a variety of activities, and for the most part had acquired their knowledge through family ties. The majority of these healers were elderly, aged between 55 and 70. The most frequently cited plants were *Phyllanthus muellerianus* (10 times), *Smilax anceps* (8 times) and *Carica papaya* (4 times). The mode of acquisition was through family ties (68.57%), followed by community and dreams (11.43%). Recipes were prepared mainly by infusion (60%) and maceration (28.57%). In view of these results, we feel it is imperative to extend this study to all prefectures and regions of Guinea, with a view to strengthening data banks in this field, for the benefit of future technologies for the pharmaceutical industry.

KEY WORDS: *Prostate*; *Prostatitis*; *Ethnobotany*; *Ethno-medicines*; *Boke*

1. Introduction

The use of medicinal plants is still important in African traditions. Living beings have always sought to use plants to ensure their survival, and to derive remedies from them to treat their illnesses (Mahomoodally, 2013). Indeed, primary health care relies heavily on medicinal plants and the local knowledge associated with them (Fyhrquist, 2007). Ethnobotany, the science of how communities in a given region use plant species for food, clothing and medicine, plays a fundamental role in understanding how communities perceive, use and conserve plant resources (Aiyeloja and Bello, 2006; Betti, 2004). It enables popular know-how to be translated into scientific knowledge (Tahiri *et al*., 2012). However, in our tropics, most ethnobotanical studies in general and ethno-medicinal studies in particular, focus on the inventory and analysis of plant uses, without sufficiently highlighting the

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associated practices, which are thus overlooked (Malan and Neuba, 2011).

In Guinea, as elsewhere in Africa, traditional medicine is a very important component of cultural heritage, deeply rooted in the history, culture and beliefs of the people, and determines their aptitudes and behaviour in the face of the personal, family and social events of daily life (Banza *et al*., 2020). Until the middle of the 20th century, medicinal plants still held an important place in people's therapeutic arsenals, and there was no resistance to their use for both benign and serious illnesses (Banza *et al*., 2020).

In Africa, 80% of the population use medicinal plants to satisfy their health needs, either out of cultural habit or financial necessity (Banza *et al*., 2020). Some sexually-transmitted infections are bacterial in origin and can be cured by medicinal plants. It is therefore to be hoped that prostatitis can also be treated. By the age of 80, one man in nine (1/9) will have developed prostatitis (Krieger *et al*., 2008).

With this in mind, and faced with the high cost of conventional medicines and the risk of counterfeiting, more and more people are turning to herbal remedies. Traditional medicine is thus becoming a credible alternative worth exploring in depth.

We therefore decided to carry out an ethnobotanical survey in the Boké region, in order to identify a number of anti-prostatitis plants and, finally, to carry out a phytochemical studies of a number of species with prostatitis properties, hence the choice of the theme "Ethnobotanical investigation of plants with prostatitis properties in the Prefecture of Boke".

2. Material and Methods

2.1 Presentation of the study area

The prefecture of Boké was used for the ethnobotanical investigations. Located on Guinea's maritime coast, Boké covers an area of 334 km^2. It is located in the North-Western part of Guinea, known as maritime Guinea, and more specifically in Baga country. The Boké region borders Senegal to the north, Guinea-Bissau to the west and the Gaoual prefecture to the northwest. To the south-west, the region borders the Atlantic Ocean (Fig. 1). It had a population of 108,145 in 2014, with a density of 35 inhabitants/km^2. The natives who built Boké were initially Landoumas, after which the Bagas settled on the Boké plateau, extending as far as Guinea-Bissau to the north and approaching the plains of the Rio Kapatchez to the south.

Close to Guinea Bissau, a tarmac road allows you to cover the 250 km distance to Conakry quickly. At regional level, a tarred road takes you 50 km from Kamsar, and tracks lead to Sangarédi or Gaoual.

The town of Boké is the most cosmopolitan in Guinea, with Nalous living along the coast, Landoumas, Bagas, Soussous, Peuls, Kissis,

Fig. 1: Boke Card

Diakankés (Baralandés and Coréah) and Mikiforês. The "Camara" Fulani were the first from Fouta to settle in Kakandé (IRD, 2001).

2.2 Ethno-botanical survey

Study setting: The prefecture of Boké served the ethnobotanical investigation work, which took place from 06 April to 02 July 2018.

2.3 Working materials

Plant material: The plant material consisted of: leaves, roots and stem barks of the twelve (12) plants (Fig. 2 and Fig. 3) selected during the ethnobotanical survey. The different parts of these plants were collected from 06 April to 02 July 2018 in the prefecture of Boké. Botanical identification was carried out at the National Herbarium of Guinea.

Harvesting equipment: Daba, Cutters, Polyethylene bag, Cardboard folder; Scissors; Pruning shears.

2.4 Working method

Type and period of study: This was a prospective cross-sectional survey conducted from April 6 to July 2, 2018.

Study population: Our investigations focused on traditional practitioners in the prefecture of Boké recognized by the population in the treatment of prostatitis.

2.5 Method of analysis

The results are presented in tabular form, analyzed and interpreted. They were processed manually, and entered using computer software.

Inclusion and exclusion criteria:

Inclusion criteria

- Traditherapeutes living in Boké and recognized by the community, able to treat prostatitis
- Agree to participate voluntarily in the study.

Exclusion criteria

- Any healer also using modern prostatitis treatment.

2.6 Contact with the authorities

After receiving the mission order issued by the Department of Chemistry, we travelled to the prefecture of Boké to carry out the surveys. We then received orders from the prefectural and communal authorities.

2.7 Contact with healers

In the interests of maintaining confidentiality and safeguarding the family heritage, we had difficulty gaining access to information. Guided by an intermediary, we were able to meet the healers. This approach to our introduction to the healers involved the presentation of colas and sums of money, depending on the case.

2.8 Data collection

The data collection method used was interactive. It consisted in questioning healers about their art, in the form of an interview and on the basis of a survey form, a model of which can be found in the appendix.

In order to respect the confidentiality surrounding the practice of traditional medicine, we opted for individual contact, using the survey forms drawn up by the Institut de Recherche et de Développement des Plantes Médicinale et

Halieutique. They contained the following information;

- Survey location;
- Information on the healer;
- Part of the plant used;
- Method of preparation;
- Dosage;
- Duration of treatment.

2.9 Drug harvesting

The drugs were harvested from plant parts such as leaves, roots and stem bark. The drugs were then transported to the city (to our home) and then to the organic chemistry laboratory of the Gamal Abdel University in Conakry for drying. This takes place in the shade, followed by packaging in polyethylene bags. At the end of this operation, the samples were transported to the Organic Chemistry Laboratory of the Chemistry Department at Conakry's Gamal Abdel Nasser University.

2.10 Healer's diagnosis

- Pain on urination;
- Pus on urination;
- Blood in urine;
- Lumbar pain.

3. Results and Discussion

Our work focused on the ethnobotanical investigation and monograph of plants used in the treatment of prostatitis in traditional Guinean medicine in the prefecture of Boké, which took place from 06 April to 02 July 2018.

In total we met 35 healers including 23 men and 12 women. This predominance of men could be explained by the masculine nature of this disease. The majority of these healers were herbalists (68.57%), followed by marabouts (25.71%), planters (2.86%), and farmers (2.86%). The age of the traditherapeutes ranged from 35 to 80, with an average age of 60.

The most represented age group was 55 to 70 (45.71%) and the least represented was under 40 (22.85%) (Table 1). Judging by these results, the percentage of young people taking up the profession of traditherapeutes is low. This is why promoting traditional medicine must be a priority.

Of the 12 plants listed, *Phyllanthus muellerianus* (10 times), *Smilax anceps* (8 times), *Carica papaya* (4 times), *Pterocarpus erinaceus'* (3 times), *Dioscorea bulbifera* and *Vitex doniana* (2 times), and the other 6 only once (Table 2). Moreover, according to current literature, *Pterocarpus erinaceus* is of great importance in the treatment of a number of diseases.

It is used in North America and Europe to treat chronic diarrhoea. Decoctions or infusions of bark or roots are used to treat bronchial infections, toothache, painful menstruation, anaemia, post-partum haemorrhage, tapeworm infections, leprosy, wounds, tumours and ulcers; they are also used for their anti-emetic, purgative and tonic properties. Root-based preparations are administered as enemas to treat venereal diseases. A decoction of the leaves is used to treat fever and syphilis.

Carica papaya has many medicinal virtues. Phytotherapy uses the fruit, leaves, seeds, latex and roots. Depending on the part used, papaya is a purgative, an anti-inflammatory or an agent with positive effects on digestion, the treatment of sciatica caused by herniated discs; laxative;

Table 1: Socio-professional distribution of healers

Sl. No.	First and last names	Gender	Age	Profession	Address	Plant vernacular name (Sousou)	Part used	Galenic form
1	Banaro Maimouna	F	55	Herbalist	Dabis	Toumbégbely	R	Decoction
2	Camara Abdou	M	72	Herbalist	Sansalé	Welenwelendji	f, ET	Infusion
3	Bangoura Adama	F	80	Herbalist	Boke center	Koumissossè	f	Infusion
4	Camara Oumar	M	55	Planter	Boke center	Guésséfouté	f	Maceration
5	Manè Fatoumata	F	45	Herbalist	Boke center	Toumbégbély	R	Decoction
6	Sylla Issa	M	58	Herbalist	Boke center	Toumbégbély	f	Infusion
7	Tambasa Salématou	F	45	Herbalist	Malapouyah	Welenwelendji	f	Infusion
8	Camara Fatoumata	F	40	Herbalist	Boké center	Föfia	f	Decoction
9	Camara Moussa	M	39	Marabout	Boké center	Sougni	f	Maceration
10	N'tiasso mahawa	F	60	Herbalist	Dongol	Toumbégbély	f, ET	Infusion
11	Sylla Abdoulaye	M	70	Marabout	Dongol	Welenwelendji	R	Infusion
12	Diallo Mamadou	M	36	Herbalist	Dongol	Khary	ET	Infusion
13	Diallo Mouctar	M	49	Herbalist	Dongol	Firy forêt	f	Maceration
14	Diassy Mamadouba	M	70	Marabout	Tassimbo	Welenwelendji	f	Infusion
15	Tambassa Kadiatou	F	38	Herbalist	Tassimbo	Föfiya	f	Infusion
16	Fofana Mohamed Lami	M	38	Marabout	Tassimbo	Khary	f	Maceration
17	Fofana Soriba	M	35	Marabout	Tassimbo	Woulonyi	f	Maceration
18	Camara Oumar	M	60	Herbalist	Tassimbo	Bamba	f	Maceration
19	Sylla Bintia	F	75	Herbalist	Koffiya	Toumbégbély	f	Infusion
20	Camara Bintou	F	70	Herbalist	Koffiya	Föfiya	f	Maceration
21	Camara Alsény	M	65	Cultivator	Dibya	Toumbégbély	f	Infusion
22	Koumbassa A. Diouldé	M	35	Marabout	Tanènè	Firy forêt	f	Maceration
23	Koumbassa Mariama	F	60	Herbalist	Baralandé	Welenwelendji	f	Infusion
24	Dramé Bamba	M	58	Marabout	Baralandé	Toumbégbély	R	Infusion
25	Keita Salifou	M	65	Herbalist	Baralandé	Toumbégbély	R	Infusion
26	Sambou M'mahawa	F	57	Herbalist	Sansalé	Welenwelendji	f	Infusion
27	Savané Fatoumata	F	61	Herbalist	Kissassi	Sougni	f	Maceration
28	Khalissa Mamdouba	M	80	Marabout	Kissassi	Piya	f	Infusion
29	Koumbassa Aboubacar	M	40	Marabout	Tanènè	Föfiya	F	Infusion
30	Chérif yalatif	M	59	Herbalist	Boké Centre	Koussou	f, ET	Infusion
31	Koumbassa Alsény	M	65	Herbalist	Kolaboui	Toumbégbély	f	Infusion
32	Sylla Boubacar	M	68	Herbalist	Kolaboui	Welenwelendji	f	Decoction
33	Keita Alsény	M	78	Herbalist	Kolaboui	Toumbégbély	f	Infusion
34	Soumah Boubacar	M	80	Herbalist	Kolaboui	Khary	f	Maceration
35	Bangoura Alya	M	70	Herbalist	Kolaboui	Welenwelendji	f	Infusion

Legend: F: Female; M: Male f: Leaf; R: Root; ET: Stem Bark.

Table 2: Frequency of citing the plant

Common names of plants	Scientific names	Frequency
Toumbégbély	*Phyllanthus muellerianus*	10
Welenwelendji	*Smilax anceps*	8
Föfiya	*Carica papaya*	4
Khary	*Pterocarpus erinaceus*	3
Firyforêt	*Dioscorea bulbifera*	2
Sounyi	*Vitex doniana*	2
Koumissossè	*Premna hispida*	1
Guésséfouté	*Gossipium barbadense*	1
Piya	*Persea americana*	1
Koussou	*Anacardium occidentale*	1
Woulonyi	*Daniellia oliveri*	1
Bamba	*Cassia sieberiana*	1
	Total	35

vermifuge; purgative; analgesic, relaxant; papaya protects against the induction of cotton cancer.

Papaya has a de-infiltrating and anti-inflammatory effect. Papaya is recommended for the treatment of peptic ulcer.

Infections from the leaves can be used to treat bloating and other digestive problems.

Cassia siberiana's purgative action can be attributed to its anthraquinones. Flavones promote diuresis and have antibacterial and anti-inflammatory activity. A test for antiviral activity against Herpes simplex virus type 1 (HSV-1) showed that *Cassia sieberiana* extracts had significant activity against this virus. In vitro tests showed only weak activity against trypanosomes. Leaf extracts were found to be active against *Staphylococcus lutea*, *Mycobacterium phlei*, *Bacilllus subtilis* and *Proteus* sp, (Kamanzi *et al*., 2002).The majority of these plants were prepared by infusion (60%), followed by maceration (28.57%) and decoction (11.43%) (Table 3).

Table 3: Breakdown of recipes by galenic form

Sl. No.	Galenic forms	Citation frequencies	Percentage (%)
1	Infusion	21fois	60.00
2	Maceration	10fois	28.57
3	Decoction	4fois	11.43
	Total	35	100

With regard to the method of acquiring knowledge, our work shows that 68.57% of traditherapeutes acquired their knowledge through their families, respectively 22.86% (father), 20% (grandfather), 17.14% (grandmother) and 8.57% (mother).

The least common was acquisition through professional experience (2.86%) (Table 4).

Table 4: Different ways in which healers acquire knowledge

Method of acquisition		Number of healers	Percentage	
Family Parental	Father	8	22.86	68.57
	Grandfather	7	20.00	
	Grandma	6	17.14	
	Mother	3	8.57	
	Community	4	11.43	
	Dream	4	11.43	
	Learning	2	5.71	
	Personal experience	1	2 .86	
	Total	35	100	

Inheritance was the most common method of acquisition, followed by community and dreams. This could be explained by the long African tradition according to which art is passed down

from generation to generation (from grandfather to father or grandmother to mother).

The most commonly used parts are: leaves (60%); roots (31.43%), followed by stem bark (Table 5).

Table 5: Breakdown of recipes according to the part of the plant used

Organs	Frequencies	Percentage
Leaves	28	73.68
Roots	6	15.79
Stem bark	4	10.53
Total	38	100.00

Twelve (12) plants were identified for the treatment of prostatitis. The most frequently cited plants belong to the Euphorbiaceae family (10); Smilaceae (8); Caricaceae (4); Leguminoseae-Cesalpinoideae (3) (Table 6).

4. Conclusion

Today, with the help of scientific and technological progress, African countries must fight to bring the positive contributions of traditional medicine into the mainstream of modern medicine. In Guinea, Traditherapeutes are the first port of call for the treatment of urinary tract infections. Thus this botanical survey conducted from 06 April to 02 July 2018 in the prefecture of Boké identified 35 Traditherapeutes including 12 women and 23 men.

Botanically, 12 plant species were identified. The most frequently cited plant species were *Phyllanthus muellerianus* (10 times) and *Smilax anceps* (8 times). All the medicines were prepared with water, and the recipes were presented in different forms: Infusion 60%, Maceration 28.57%, and Decoction 11.43%.

Table 6: List of anti-prostatitis plants found in the prefecture of Boké

Family	Scientific names	Common names			Part used
		Sussu	Pular	Maninka	
Euphorbiaceae	*Phyllanthus muellerianus*	Toumgbegbely	--	Tri	R, f
Smilacaceae	*Smilax anceps*	Welenwelendji	--	--	R, f
Caricaceae	*Carica papaya*	Fofiya	Popo	Yiridjé	R, f
Leguminosae-Cesalpinoideae	*Pterocarpus erinaceus*	Khary	Bani	Ben	ET
Discoreaceae sp	*Dioscorea bulbifera*	Firy forêt	Pouri-balé	Dan-dan	F
Verbenaceae	*Vitex doniana*	Sounyi	Doukoumé	Sounsoun	F
Verbenaceae	*Premna hispida*	Koumissosso		Bilankourou fida	F
Malvaceae	*Gossypium barbadense*	Guéssefouté	Diarounde	Tourouba	F
Lauraceae	*Persea americana*	Piya	Piya	Piyah	F
Anacardiaceae	*Anacardium occidentale*	Koussou	Yalaguè	Somo	f, ET
Leguminosae-Cesalpinoideae	*Daniellia oliveri*	Woulougni	Kévé	Sandan	F
Leguminosaea-MimosoÏdeae	*Cassia sieberiana*	Bamba	Sindia	Sindjan	F

Legend: f: Leaf; R: Root; ET: Stem Bark.

Phyllanthus muellerianus

Smilax anceps (Wild)

Carica papaya L

Pterocarpus erinaceus (Pear)

Dioscorea bulbifera L

Vitex doniana (Sweet)

Premna hispida

Gossypium barbadense L

Fig. 2: Representative images of the plant species observed during the survey

Persea americana

Anacardium occidentale L

Daniellia oliveri

Cassia sieberiana

Fig. 3: Representative images of the plant species observed during the survey

The most frequently cited parts are root, leaf and stem bark. Our studies show that this knowledge is held almost exclusively by the elderly.

5. Conflicts of interests

Authors declare that there is no conflict of interest exists.

6. Reference

Aiyeloja, A. A., & Bello, O. A. (2006). Ethnobotanical potentials of common herbs in Nigeria: A case study of Enugu state. *Educational Research and Review, 1*(1), 16–22.

Banza, M. I., Kasanga, T. K., Mukakala, A. K., Ben N'dwala, Y. T., Ngoie, C. N., Cabala, V. D. P. K., Shutsha, N. T., Lire, L. I., Unen, E. W., & Kapessa, N. D. (2020). Prostatites aiguës sur prostate non tumorale aux cliniques universitaires de Lubumbashi: aspects épidémio-clinique et thérapeutique. *The Pan African Medical Journal, 37*, 290. doi:10.11604/pamj.2020.37.290.21260

Betti, J. L. (2004). An ethnobotanical study of medicinal plants among the Baka pygmies in the Dja biosphere reserve, Cameroon. *African Study Monographs, 25*, 1–27.

Fyhrquist, P. J. (2007). Traditional medicinal uses and biological activities of some plant extracts of African *Combretum* Loefl., *Terminalia* L., and *Pteleopsis* Engl. species (Combretaceae). *Ph.D. Dissertation, University of Helsinki, Finland.* (p. 185).

IRD. (2001). Info géographique de la Guinée Maritime. Conakry: Institut de Recherche pour le Développement.

Kamanzi Atindehou, K., Koné, M., Terreaux, C., Traore, D., Hostettmann, K., & Dosso, M. (2002). Evaluation of the antimicrobial potential of medicinal plants from the Ivory Coast. *Phytotherapy Research, 16*(5), 497–502. doi:10.1002/ptr.970

Krieger, J. N., Nyberg, L., & Nickel, J. C. (2008). NIH consensus definition and classification of prostatitis. *JAMA, 282*(3), 236–237. https://doi.org/10.1001/jama.282.3.236

Mahomoodally, M. F. (2013). Traditional medicines in Africa: An appraisal of ten potent African medicinal plants. *Evidence-Based Complementary and Alternative Medicine*, Article ID 617459. https://doi.org/10.1155/2013/617459

Malan, D. F., & Neuba, D. F. R. (2011). Traditional practices and medicinal plants use during pregnancy by Anyi-Ndenye women (Eastern Côte d'Ivoire). *African Journal of Reproductive Health, 15*(1), 85–93.

Tahiri, N., El Bouzidi, A., Zidane, L., Rochdi, A., & Douira, A. (2012). Étude floristique et ethnobotanique des plantes médicinales spontanées dans la région de Oulmes (Maroc). *Journal of Forestry Faculty, 12*(2), 192–208.